CHAPTER 3 - AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the existing environmental, social, and economic conditions within the project area and the potential environmental consequences of the Proposed Action, including any cumulative impacts[1], as to the following resource areas:

- Land Use
- Social
- Environmental Justice
- Economic
- Relocations
- Pedestrians and Bicyclists
- Air Quality
- Noise
- Geology, Soils, and Topography
- Water Quality
- Cultural Resources
- Visual Conditions
- Invasive Species
- Construction

Areas of potential impacts for individual resource areas may vary and are delineated herein on a case-by-case basis, as appropriate. Existing conditions were identified based on literature and data file searches; coordination with local, regional, state, and federal officials; and field investigations conducted according to generally accepted methodology and practices. Specific methodologies employed in this analysis are set forth in the individual resource areas and in those reports that have been included as Appendices to this document.[2]

Certain environmental resource areas are not present in the project area and are therefore not included in the impact analysis. These resources areas are:

- **Farmlands** – The project area is within an "urbanized area" according to the Census Bureau Map. No prime, unique, or statewide important farmlands were identified in the project area.
- **Wild and Scenic Rivers** – No rivers that are included in or qualify for inclusion in the National Wild and Scenic Rivers System were identified in the project area.
- **Wetlands** - A reconnaissance site visit was conducted, which determined that there were no "Waters of the U.S." as regulated by the United States Army Corps of Engineers (USACE) or wetlands as defined by the USACE Wetlands Delineation Manual within the project area. Based on this information, a Section 404 Permit is not required for the project.
- **Floodplains** - Consultation of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) maps indicated that there are no floodplains within the project area.

[1] Cumulative impacts are defined as those impacts that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. *See* 40 CFR 1508.7.

[2] Additional information relating to the technical research performed in the preparation of this Environmental Assessment that are not discussed in this document are included in the project records and the technical reports that are listed in the List of Technical Reports.

- **Threatened and Endangered Species and Wildlife** - The project is located in an urbanized area. The U.S. Fish and Wildlife Service (USFWS) Threatened and Endangered Species list and the Utah Division of Wildlife Resources (UDWR) Sensitive Species list were consulted and a site visit of the project area was performed, all of which indicated the absence of any federally listed threatened or endangered species, Utah sensitive species, or suitable habitat for any federal or state listed threatened, endangered, or sensitive species in the project area.
- **Hazardous Waste** - A search of the Comprehensive Emergency Response, Compensation, and Liability Information System (CERCLIS) database has determined that there are no Comprehensive Emergency Response, Compensation, and Liability Information Act (CERCLA or Superfund) sites within the project area. The nearest CERCLA site is located at 2100 South and Highland Drive, which is not listed on the National Priority List (NPL). A search of the Resource and Conservation Recovery Act (RCRA) database turned up no RCRA sites within the project area. The nearest RCRA sites are located outside the project area in the commercial centers south of 2100 South.

3.1 LAND USE

3.1.1 Affected Environment

Zoning Maps and Land Use Master Plans

Zoning maps and land use master plans are used to show current and planned land uses within municipalities. Zoning maps show how land within a municipality is currently zoned and land use plans show proposed future land uses.

Land use along the I-80 corridor is zoned mainly residential (single and multiple family) with commercial areas located along State Street, 700 East, and 1300 East. See Figures 3-1 and 3-2. The Future Land Use Plan from Salt Lake City shows a continuation of the same patterns of land usage. See Figure 3-3. South Salt Lake City is currently in the process of updating their General Plan.

Open Space, Parks, and Recreation Facilities

Existing Open Spaces, Parks and Recreation Facilities

There are several parks and recreation facilities along the I-80 corridor. See Figure 3-4. These include:

- **Fairmont Park** (includes the Fairmont Aquatic Center)
- **Forest Dale Golf Course**
- **Elizabeth Sherman Park**
- **South Salt Lake Lions Mini Park**
- **Sugarhouse Park**
- **Hidden Hollow Park** [located at 1255 East 2160 South in the Sugarhouse Shopping Center]

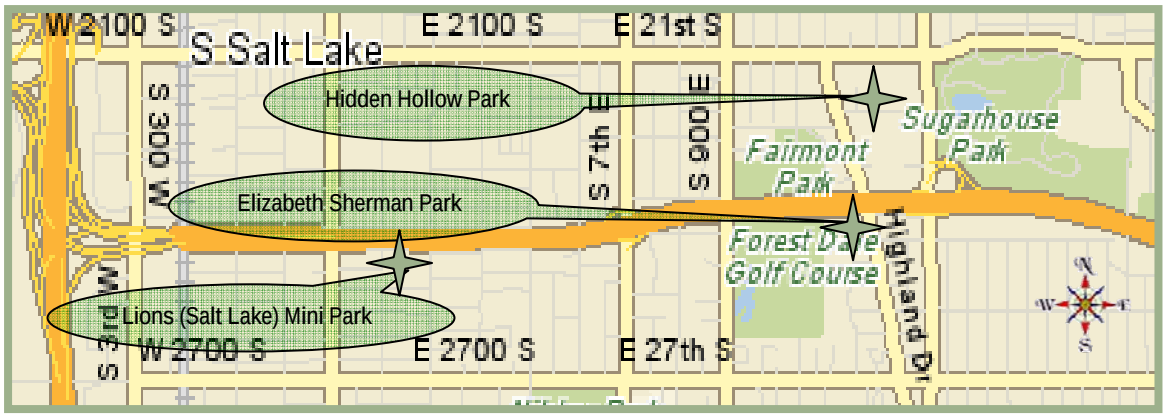

Figure 3-4. Open Space, Parks and Recreation Facilities Along I-80 Corridor

Planned Open Spaces, Parks and Recreation Facilities

Future plans for the project area include plans for a multi-use pedestrian/bicycle trail known as the Parley's Creek Corridor Trail, discussed in Section 3-7 – Pedestrians and Bicycles.

3.1.2 No-action Alternative

Under the No-action Alternative, current land-use plans and trends would not be altered. The area is sufficiently developed so as to exclude major changes in land usage and zoning in the foreseeable future.

3.1.3 Proposed Action

Direct Effects

Elizabeth Sherman Park

Elizabeth Sherman Park currently runs along the south side of I-80 west of Highland Drive. The Highland Drive bridge structures currently span approximately 250 feet, encompassing both the Highland Drive roadway and what was previously the Wilford Brickyard Spur of the Denver and Rio Grande Western Railroad. The Proposed Action would shorten the length of the Highland Drive bridge structures by approximately 107 feet and fill in the area previously occupied by the railroad spur, thus reducing the cost to replace the structures. The Proposed Action would also construct a new bridge structure on the south to carry the modified 1300 East eastbound off-ramp. See Figures 3-5 and 3-6.

The new structure would impact Elizabeth Sherman Park in that it would extend over the existing footprint of the park (thus blocking sunlight from reaching the ground) and would require relocation of the existing sidewalk, which would still provide sufficient connection between the residential communities on the south and the commercial area on the north. Discussions with Salt Lake City officials indicated that the reduction in the length of the Highland Drive bridge structures would reduce maintenance costs for the park and existing vagrancy problems in the area.

Figure 3-5. Existing Elizabeth Sherman Park and Conceptual Rendering of Proposed Alteration

Indirect Effects

There would be no indirect effects on land uses due to the Proposed Action.

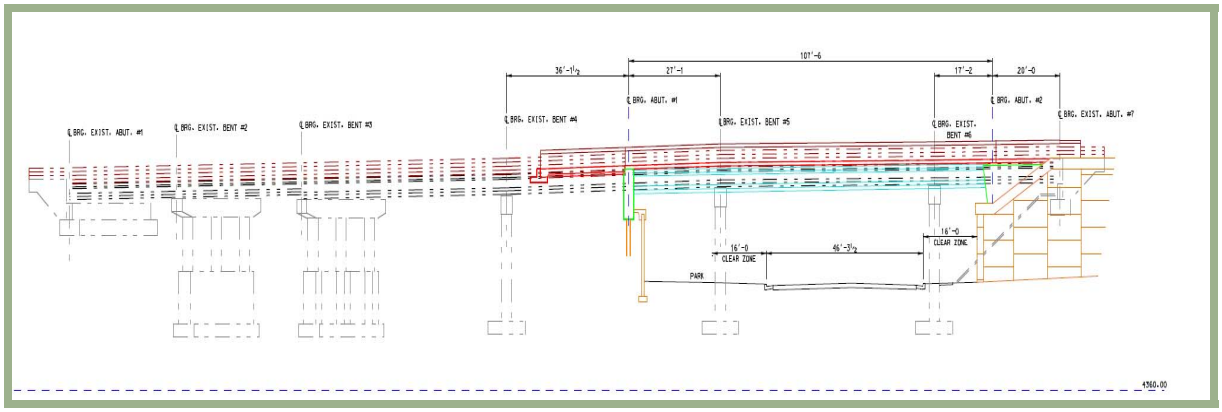

Figure 3-6: Typical of the New Bridge Structure at Highland Drive

3.1.4 Proposed Mitigation Measures

Mitigation measures include relocation of the existing sidewalk and Context Sensitive Solutions (CSS), such as aesthetic treatments, appropriate landscaping, etc.

3.2 SOCIAL CONDITIONS

3.2.1 Affected Environment

Methodology

Census data from the 2000 Census (as the most recent Census data available) was used to establish an approximation of social and demographic characteristics of the population residing in the communities adjacent to I-80 in the project area. Individual surveys were distributed to the residents of Driggs Avenue to obtain input as to their views regarding the project and its impact on their neighborhood specifically because of the needed relocations identified early in the project development from the proposed cul-de-sac. Residents in other portions of the project area were not individually surveyed. Findings from these surveys were compiled by Dr. Richard Krannich into a report entitled *Social Assessment for the Proposed I-80 State Street to 1300 East Improvement Project.*

Overall Community Context

The neighborhoods within the project area have been established for a considerable length of time and exhibit fairly stable social conditions and population characteristics. The majority of the population in the project area are white (81%) with racial minorities in the project area overall constituting 19% of the population. For the purposes of this ES, the neighboring communities were divided into six groups (see Figure 3-7):

Neighborhood Group 1: North of I-80 at the western end of the project area, bounded by Main Street on the west, 500 East on the east, 2100 South on the north, and I-80 on the south.

Neighborhood Group 2: South of I-80 at the western end of the project area, bounded by Main Street on the west, 500 on the east I-80 on the north and 2700 South on the south.

Neighborhood Group 3: North of I-80 in the middle portion of the project area, bounded by 500 East on the west, 900 East on the east, 2100 South on the north, and I-80 on the south.

Neighborhood Group 4: South of I-80 in the middle section of the project area, bounded by 500 East on the west, 900 East on the east, I-80 on the north, and 2700 South on the south.

Neighborhood Group 5: South of I-80 in the eastern section of the project area, bounded by 900 East on the west, 1300 East on the east, I-80 on the north, and 2700 on the South.

Neighborhood Group 6: South of I-80 in the eastern section of the project area, bounded by 900 East on the west, 1300 East on the east, I-80 on the north, and 2700 South on the south.

Figure 3-7. Neighborhood Groups

The racial composition of the population varies greatly between neighborhoods, ranging from less than 6% minority in Neighborhood Group Six to over one-third (38%) in Neighborhood Group Two. This variation also occurs in the Hispanic/Latino population for the project area, with an overall percentage 12.2% and a range of 2.9% for Neighborhood Group Six to approximately 20% in Neighborhood Groups Two and Four. In comparison, Salt Lake City has a minority population of 13.8%, with a Hispanic/Latino population of 11.8%.

Within the project area, there is a higher percentage of residents over the age of 65 years than for Salt Lake City (12.7% versus 8.1%), with a range of 5.3% in Neighborhood Groups Three and Five to 18% in Neighborhood Group One. For low-income populations, the project area poverty level is slightly higher than Salt Lake City (11.5% to 8.0%, respectively); with a range from 7.4% in Neighborhood Group One to 16.1% in Neighborhood Group Four. The racial/ethnic, elderly, and low-income population percentages per Neighborhood Groups are shown in Figure 3-8.

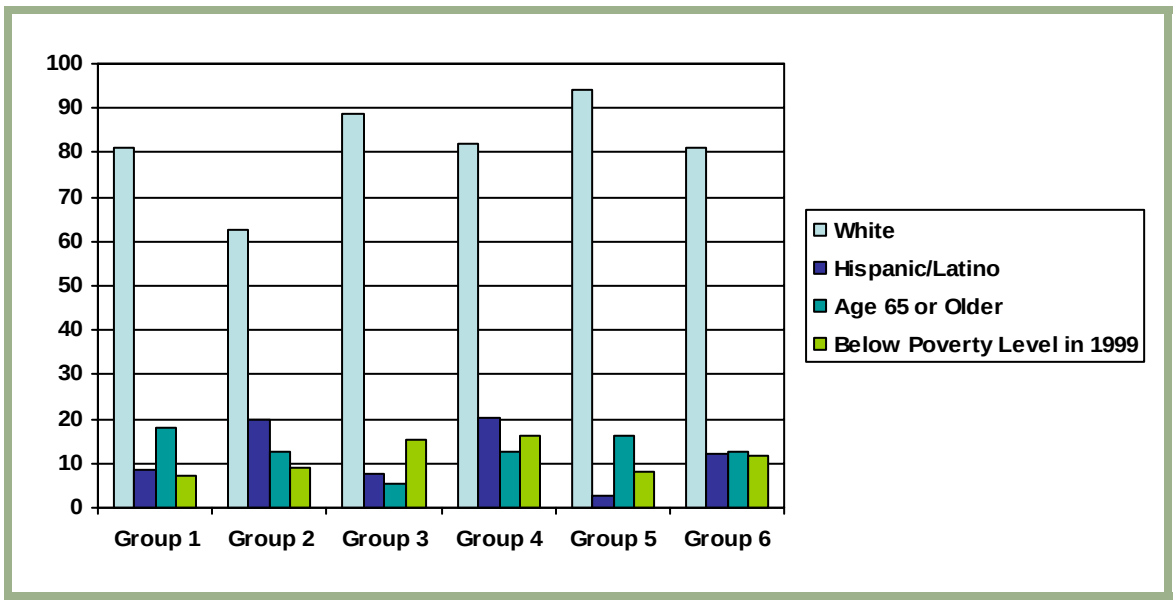

Figure 3-8. Selected Socio-Demographic Characteristics of Populations within the Project Area

Neighborhoods Adjacent to I-80

For those neighborhoods closest to the I-80 corridor, approximately 3,308 persons (or 35% of the total project area population) reside within a two-block distance. This included 1,390 households with an average household size of 2.38 persons. The majority of the population is white (87.5%) with a minority population that varied throughout the project area from 6.6% in portions of Neighborhood Group Six nearest to I-80 to 16.1% in the portion of Neighborhood Group Four and an Hispanic/Latino population that varied from 0% in Neighborhood Group Five to 23.9% in Neighborhood Group Two for those living within two blocks of I-80. Data regarding income levels or the incidence of poverty are not reported at the block level and therefore cannot be included in this scale of analysis. The racial/ethnic population and elderly percentages per Neighborhood Group are shown in Figure 3-9.

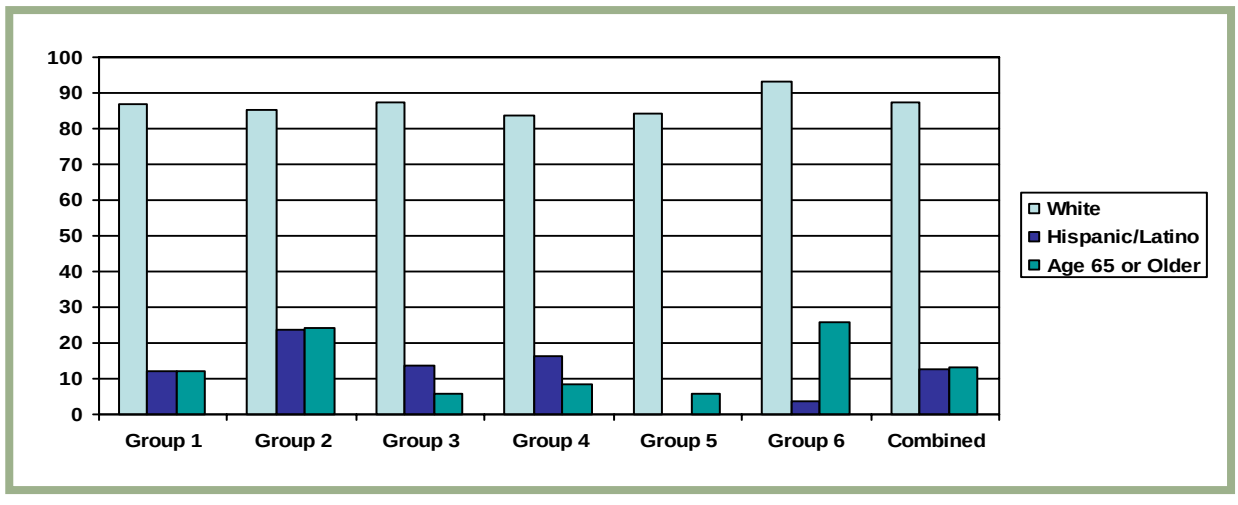

Figure 3-9. Selected Socio-Demographic Characteristics of Corridor-Proximate Population

The composition of the households adjacent to I-80 also varied from a mean size of 1.96 in Neighborhood Group Six to 2.67 in Neighborhood Group Two, with at least one member under the age of 18 being at 17.5% in Neighborhood Group Six ranging to 40% in Neighborhood Group Five. The households with at least one member over the age of 65 varied from 13% in Neighborhood Groups Three and Five to 35% in Neighborhood Group Six (totaling approximately one-fourth of the corridor-proximate households).

Public Facilities

Schools: The project area runs through two different school districts: Granite School District (dividing the Wilson Elementary School district), from the western termini of the project area at State Street to 500 East, and Salt Lake City School District (dividing the Nibley Elementary School district), from 500 East to the eastern termini at 1300 East.

Emergency Services: Emergency services in the area are provided by the South Salt Lake Police and Fire Departments, by the Salt Lake City Police and Fire Departments, and by the Salt Lake County Sheriff and the Utah Highway Patrol.

Utilities: Public utility services such as water, sewer and garbage in the area are provided by Salt Lake City and South Salt Lake City to their respective communities. Electrical services are provided by Rocky Mountain Power, a division of PacifiCorp (previously known as Utah Power & Light Company).

Other Public Facilities: The Columbus Library is located on 2530 South 500 East, which is part of the Salt Lake County Library system. There are local government offices for South Salt Lake located at 220 East Morris Avenue.

3.2.2 No-action Alternative

Under the No-action Alternative, there would be no changes to existing social trends. The area is fully developed with established residential neighborhoods. Overall noise levels would continue to increase along with the anticipated growth in traffic (although specific periods of time may experience a decrease in noise due to gridlock on I-80). Levels of social interaction and turnover are not expected to increase.

3.2.3 Proposed Action

Direct Effects

The Proposed Action would have mostly beneficial impacts on the neighboring communities. Adding capacity to the roadway, as well as the other geometric improvements, would reduce frustration levels with the residents who indicated that they use I-80 on a regular basis. The composition of the project area population, population growth patterns, levels of familiarity and interaction among neighbors, and neighborhood activity patterns are not likely to change due to the proposed highway modifications. Noise levels, which residents indicated was their primary concern, will decrease as a result of the Proposed Action due to mitigation measures being implemented where appropriate (see Section 3.9 – Noise for additional details). The

proposed project would not alter the existing physical or social conditions in the surrounding residential neighborhoods.

The closure of Driggs Avenue at 1300 East would result in relocations of the three houses where the cul-de-sac is to be constructed. Residents along Driggs Avenue expressed support for the closure since it would eliminate traffic conflicts at 1300 East and result in less traffic along Driggs Avenue. Other potential relocations have not been specifically addressed in the social study as they have yet to be finalized.

Construction impacts would include construction-related noise, dust, and periodic traffic flow disruptions, but these impacts would be temporary. Staging areas would be located at the area contained within the westbound on-ramp at 1300 East and in the parking lots of the Forest Dale Golf Course on 900 East. Construction of the bridges is anticipated to take place in designated staging areas, with the use of rapid bridge replacement techniques and periodic weekend road closures in order to minimize traffic flow disruptions.

Indirect Effects

No indirect impacts are anticipated from the Proposed Action.

3.2.4 Proposed Mitigation Measures

Construction impacts will be mitigated by use of a traffic control plan, as well as noise, vibration-control, and dust-control measures. Access to all residences and businesses will be maintained. Construction-related closures will be minimized through the use of rapid bridge replacement techniques and only periodic weekend road closures.

3.3 ENVIRONMENTAL JUSTICE

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, signed by the President on February 11, 1994, directs federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority and low-income populations to the greatest extent possible and permitted by law.

Executive Order 12898 and the United States Department of Transportation (USDOT) and the Federal Highway Administration (FHWA) Orders on Environmental Justice address persons belonging to an identified racial/ethnic minority[3] or classified as low-income.[4]

[3] The racial/ethnic minorities identified in connection with Environmental Justice are:

Black - a person having origins in any of the black racial groups of Africa

Hispanic - a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race

Asian - a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent

American Indian and Alaskan Native - a person having origins in any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition

Native Hawaiian or Other Pacific Islander - a person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands

Fundamental Environmental Justice principles include:

- To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process
- To prevent the denial of, reduction in, or substantial delay in the receipt of benefits by minority and low-income populations

3.3.1 Affected Environment

Methodology

Racial and income/poverty level statistics for the neighborhoods within the project area were drawn from 2000 Census data.

Socio-Demographic Characteristics of the Population within the Project Area

Ethnicity and low income populations are identified as a percentage of the total population in Table 3-1.

Table 3-1. Selected Socio-Demographic Characteristics Regarding Environmental Justice Issues

Characteristic	Neighborhood Groups					Aggregate / Totals		
	One*	Two*	Three & Five	Four	Six	Project Area	Salt Lake City	Utah
Total Population	1,947	1,923	1,944	2,038	1,475	9,327	181,743	2,233,169
White	81.0%	62.4%	88.6%	81.9%	94.2%	81.0%	79.2%	89.2%
Hispanic or Latino Population (of any race)	8.5%	19.7%	7.5%	20.1%	2.9%	12.2%	18.8%	9.0%
Percent Below Poverty Level in 1999	7.4%	9.2%	15.5%	16.1%	8.1%	11.5%	15.3%	8.0%

Source: U.S. Bureau of the Census 2000 Census SF-3 sample data

** excludes small portions of Neighborhood Groups One and Two that are located in the one-block section between Main Street and State Street. These western-most portions of the project area fall within Census Tract 115, Block Group 1, which extends far west of I-15 and includes extensive neighborhood areas well outside of the project area; inclusion of data from this Block Group would create biased estimates of population characteristics of these Neighborhood Groups. The excluded area includes mostly commercial land uses; only 24 people lived in the project area blocks between Main and State streets in 2000.*

3.3.2 No-action Alternative

Under the No-action Alternative, there would be no disproportionately high and adverse impacts to Environmental Justice populations.

[4] The definition of low-income is a person whose household income (or in the case of a community or group, whose median household income) is at or below the U.S. Department of Health and Human Services (HHS) poverty guidelines.

3.3.3 Proposed Action

Direct Effects

The demographic characteristics of neighborhoods adjoining the project area do not indicate that environmental justice issues are of concern related to this project. The racial composition of the population varies greatly between neighborhoods, ranging from less than 6% minority in Neighborhood Group Six to over one-third (38%) in Neighborhood Group Two. This variation also occurs in the Hispanic/Latino population for the project area, with an overall percentage 12.2% and a range of 2.9% for Neighborhood Group Six to approximately 20% in Neighborhood Groups Two and Four. In comparison, Salt Lake City has a minority population of 20.8%, with a Hispanic/Latino population of 18.8%. For low-income populations, the project area poverty level is lower than Salt Lake City (11.5% to 15.3%, respectively); with a range from 7.4% in Neighborhood Group One to 16.1% in Neighborhood Group Four. Further, the Proposed Action would not alter neighborhoods due to relocations of residents or businesses, nor would it disrupt transit, housing, or other services for Environmental Justice populations. There would be no disproportionately high and adverse human health and environmental effects on minority or low-income populations from the Proposed Action.

Multiple opportunities for public participation in the transportation process were provided to all residents in the project area (including 2 public meetings and an upcoming Public Hearing, 12 neighborhood meetings in total,[5] a project website and hotline, and other such public involvement activities), regardless of race, color, or income-level, with appropriate accommodations made for any identified need. Further, relocation resources will be available to each relocated resident without regard to race, color, national origin, or sex in compliance with Title VI of the Civil Rights Act (42 U.S.C. 2000d, et seq.).

Indirect Effects

The Proposed Action would have no indirect impacts on Environmental Justice populations.

3.3.4 Proposed Mitigation Measures

No mitigation is required.

3.4 ECONOMIC CONDITIONS

3.4.1 Affected Environment

Local Businesses

The economy of the area is largely based upon retail stores, professional services, and restaurants/fast food establishments, which are located mainly off the I-80 corridor along State Street, 700 East, Highland Drive, and 1300 East. There is also a commercial district along 2100 South. There is a residential care facility located south of I-80 near State Street.

[5] Six meetings were held previously and six more are planned for the design phase.

3.4.2 No-action Alternative

Under the No-action Alternative, there would be no substantial changes to existing economic trends or public services. Current plans for the area include commercial redevelopment of a section of Sugar House near Highland Drive and 2100 South. There would be increased congestion on I-80, which translates into higher levels of congestion on local streets as traffic seeks alternate routes.

3.4.3 Proposed Action

Direct Effects

Under the Proposed Action, travel times would be improved due to less congestion on I-80, which would make the commercial areas more accessible and thus, more attractive to potential customers. See the *Traffic Operations Anaylsis* in Appendix A. No businesses are anticipated to be relocated as a result of the Proposed Action. There would be temporary disruptions and delays during construction, which are discussed in Section 3.15 - Construction.

Indirect Effects

There would be no indirect impacts from the Proposed Action.

3.4.5 Proposed Mitigation Measures

Construction impacts will be mitigated by use of a traffic control plan, as well as noise, vibration-control, and dust-control measures. Access to all residences and businesses will be maintained.

3.5 RELOCATIONS

3.5.1 Affected Environment

UDOT defines relocations (or displacements) as "those homes and businesses being directly impacted by a proposed alignment (i.e., the [right of way] line crosses the footprint of the structure) and proximity impacts (the [right of way] line does not cross the footprint but comes so close to the structure that it is not inhabitable)."[6]

3.5.2 No-action Alternative

Under the No-action Alternative, there would be no required displacements.

3.5.3 Proposed Action

Direct Effects

Relocations Due to Right-of-Way of Acquisition

There would be three displacements due to the closing of Driggs Avenue at 1300 East in order to construct the cul-de-sac to eliminate the traffic conflicts at 1300 East. These relocations are identified as follows: 2408 South 1300 East, 2412 South 1300 East, and 1278

[6] UDOT memorandum dated April 15, 2005

East Driggs Avenue. There would be four potential displacements due to either direct or proximity impacts from the proposed new alignment and bridge structures (2360 South Lake Street, 759 East Parkway Avenue, 2394 South 800 East, 2387 South 800 East) and twelve potential displacements due to potential loss of parking structures (if no mitigation is possible), which will be determined in final design. These potential displacements are: 784 East Ashton Avenue (involving two separate structures and approximately eight displacements), and 800-804 East Ashton Avenue (approximately four displacements). See Table 3-2 and Figure 3-10.

Other Right-of-Way Acquisition

Despite the use of retaining walls to minimize right-of-way acquisition needs, some new right-of-way will need to be obtained. The total amount of right-of-way needed is approximately 1.5 acres affecting approximately 42 individual parcels of land, with the majority being minor. See Table 3-2 and Figure 3-10. There are no anticipated relocations as a result of potential soil settlement, although there may be damages to some outbuilding structures (see Section 3-10 - Geology, Soils, and Topography for further discussion).

Table 3-2. Estimated Amount of Right-of-way Acquisition Per Parcel

No.	Address	Property Type	Proposed ROW Acquisition
1	2390 South State Street	Commercial	≈74 sq. ft.
2	2375 South State Street	Commercial	≈58 sq. ft.
3	2432 South State Street	Commercial	≈784 sq. ft.
4	2435 South State Street	Commercial	≈78 sq. ft.
5	2435 South 500 East	Residential	≈77 sq. ft.
6	567 East Warnock Avenue	Residential	≈339 sq. ft.
7	2434 South 600 East	Park	≈903 sq. ft.
8	572 East Driggs Avenue	Residential	≈41 sq. ft.
9	562 East Driggs Avenue	Residential	≈303 sq. ft.
10	552 East Driggs Avenue #NFF1	Residential	≈78 sq. ft.
11	677 East Warnock Avenue	Commercial	≈552 sq. ft.
12	2427 South 700 East	Undeveloped	≈188 sq. ft.
13	2435 South 700 East	Residential	≈460 sq. ft.
14	2437 South 700 East	Residential	≈163 sq. ft.
15	2447 South 700 East	Residential	≈106 sq. ft.
16	759 East Parkway Avenue	Residential	≈8,724 sq. ft. (total)
17	2394 South 800 East	Residential	≈8,137 sq. ft. (total)
18	2387 South 800 East	Residential	≈5,054 sq. ft. (total)
19	2360 South Lake Street	Residential	≈3,990 sq. ft. (total)
20	2357 South Lake Street	Undeveloped	≈499 sq. ft.
21	766 East Ashton Avenue	Residential	≈515 sq. ft.

No.	Address	Property Type	Proposed ROW Acquisition
22	770 East Ashton Avenue	Residential	≈1,307 sq. ft.
23	784 East Ashton Avenue	Residential	≈42,569 sq. ft. maximum (total)
24	800-804 East Ashton Avenue	Residential	≈16,960 sq. ft. maximum (total)
25	810 East Ashton Avenue	Residential	≈639 sq. ft.
26	2357 South 700 East	Residential	≈478 sq. ft.
27	2349 South 700 East	Residential	≈393 sq. ft.
28	2331 South 700 East	Residential	≈305 sq. ft.
29	2327 South 700 East	Residential	≈148 sq. ft.
30	2323 South 700 East	Residential	≈101 sq. ft.
31	2319 South 700 East	Residential	≈48 sq. ft.
32	2342 South 700 East	Residential	≈454 sq. ft.
33	2332 South 700 East	Residential	≈346 sq. ft.
34	2316-2318 South 700 East	Residential	≈239 sq. ft.
35	1300 East Parkway Avenue #APRBT	Undeveloped	≈2,500 sq. ft.
36	1307 East Parkway Avenue	Residential	≈5,915 sq. ft.
37	2408 South 1300 East	Residential	≈ 4,860 sq. ft. (total)
38	2412 South 1300 East	Residential	≈4,653 sq. ft. (total)
39	1278 East Driggs Avenue	Residential	≈4,468 sq. ft. (total)
40	1270 East Driggs Avenue	Residential	≈77 sq. ft.
41	2290 South 1300 East	Commercial	≈1,303 sq. ft.
42	2294 South 1300 East	Commercial	≈1,970 sq. ft.

Indirect Effects

There would be no indirect displacements as a result of the Proposed Action.

3.5.4 Proposed Mitigation Measures

Relocations will include independent appraisals of the properties identified as potential relocations. Any right-of-way acquisitions will occur in accordance with federal, state, and local policies. The acquisition and relocation program will be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. Relocation resources will be available to each relocated resident (owner or tenant) without discrimination. UDOT will evaluate the need to provide early right-of-way acquisition for those property owners who demonstrate a hardship due to this project.

3.6 PEDESTRIANS AND BICYCLISTS

3.6.1 Affected Environment

Existing Routes and Trails

The project area is located in an urbanized area with sidewalks along the majority of the local streets and crosswalks at major intersections and across State Street and 1300 East near I-80. There are currently several bicycle facilities[7] within or in close proximity to the project area; along 300 East (Class II bike lane); along 600 East (Class III signed shared roadway); within Sugarhouse Park extending northward along 1500 East (Class II bike lane); and along 1700 East (Class II bike lane). See Figures 3-11 and 3-12.

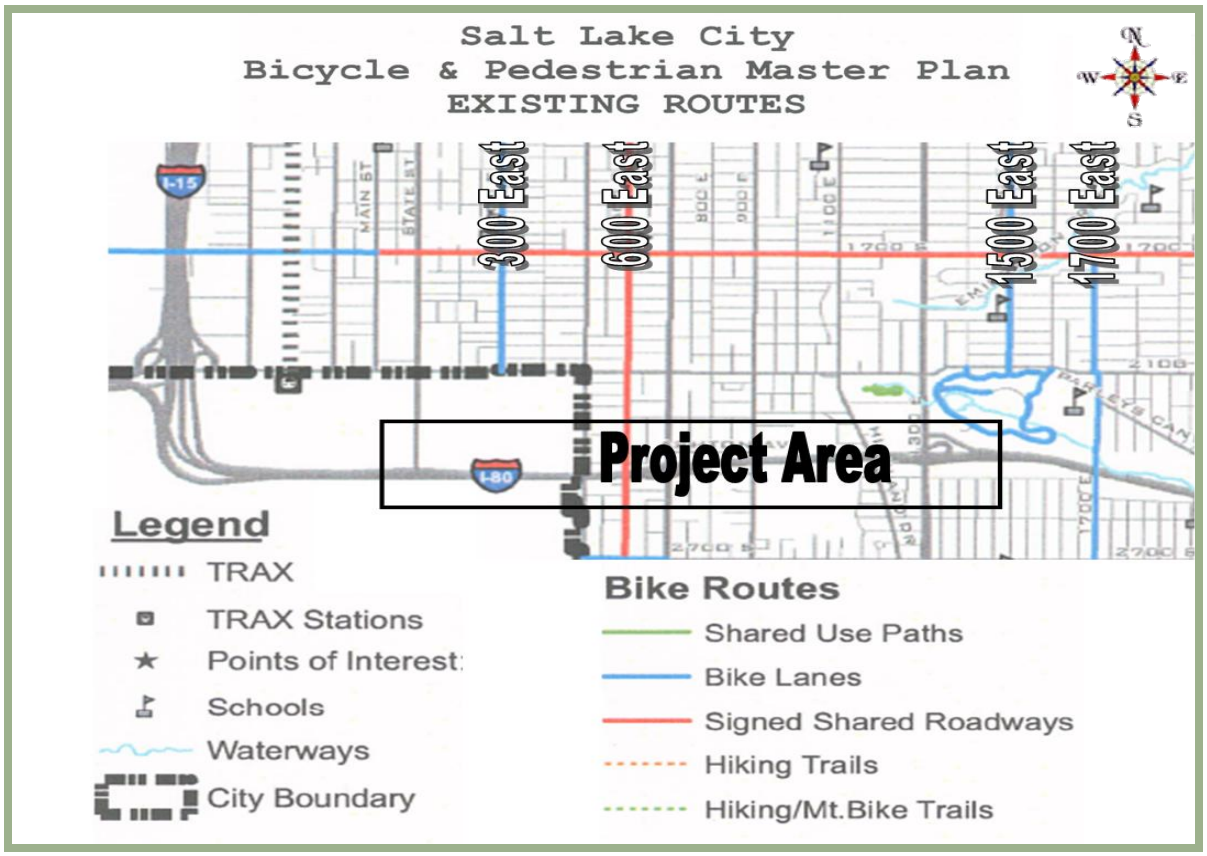

Figure 3-11. Salt Lake City Bicycle and Pedestrian Master Plan Existing Routes

[7] Bicycle facilities are divided into three classes: Class I (bicycle trail /shared use path), Class II (bicycle lane), and Class III (bicycle route/signed shared roadway). Class I is a paved off-road facility physically separated from the roadway; Class II is a facility featuring a striped lane on the paved area of a road for preferential use by bicycles; and Class III is a shared roadway with signage only.

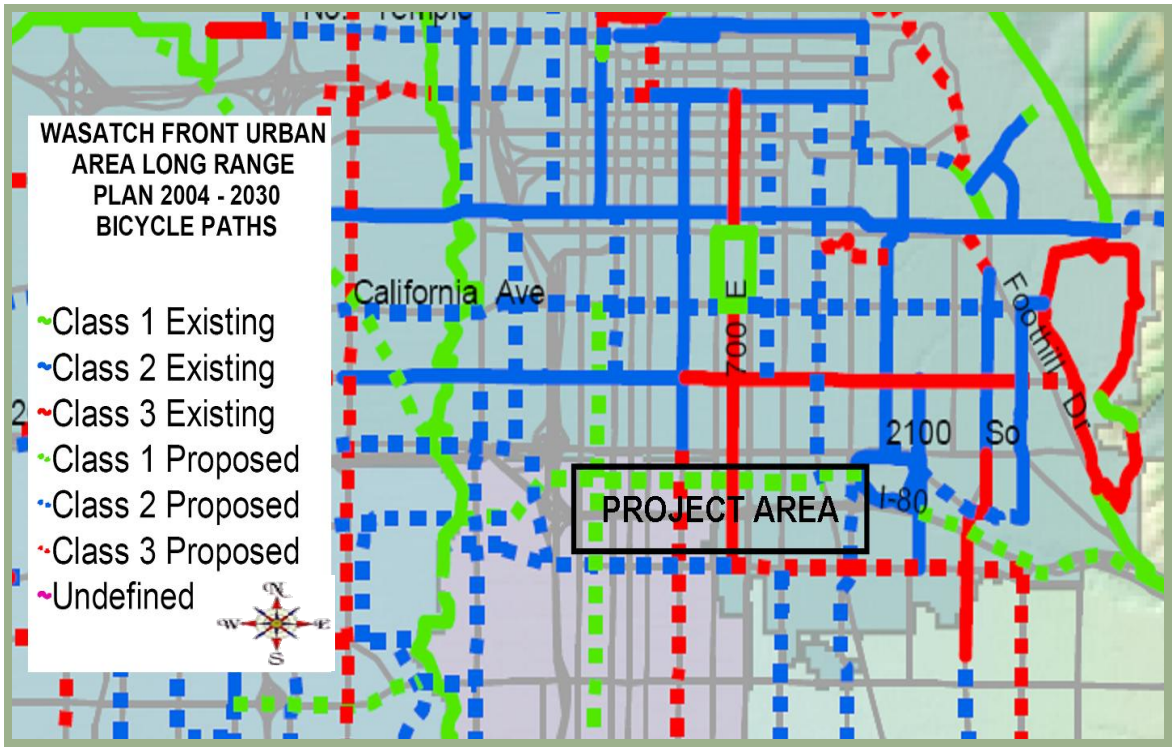

Figure 3-12. Wasatch Front Urban Area Long Range Plan 2004-2030 Bicycle Paths

Planned Routes and Trails

There are several planned bicycle routes within or in close proximity to the project area, including along Main Street, 800 East, 900 East, 2700 South, and beginning at Sugarhouse Park running west to 1100 East then northward. See Figure 3-13.

The Parley's Creek Corridor Trail

The Parley's Creek Corridor Trail is a planned east-west multi-use trail intended to link the Jordan River Trail that runs north-south along the Jordan River Parkway west of I-15 to the Bonneville Shoreline Trail and the Cottonwood Canyons that are located on the east side of the Salt Lake Valley. The Master Plan for the portion of Parley's Creek Corridor Trail that lies within the project area consist of two recommended routes from I-15 to Sugar House Park: one would run off-street east-west along the south side of I-80; the other would run east-west along the unused UTA-owned rail spur around 2100 South. See Figure 3-14.

School Walking Routes

Due to the grade separation between I-80 and the surrounding residential community, there are no school walking routes that directly intersect at-grade with I-80.

3.6.2 No-action Alternative

Under the No-action Alternative, there would be no impacts to existing or planned pedestrian/bicycle facilities.

3.6.3 Proposed Action

Direct Effects

The Proposed Action would not alter existing pedestrian and bicycle facilities in the project area, nor interfere with plans for a bicycle route along 900 East. It would also not preclude any plans for a potential route for the Parley's Creek Corridor Trail along the I-80 corridor (currently being reviewed by the Parley's Rails, Trails and Tunnels Coalition (PRATT)), although the proposed trail would be a separate action and is not incorporated into the Proposed Action. The Proposed Action is in conformity with local and regional current and future plans for improved pedestrian and bicycle mobility in the area.

Indirect Effects

The Proposed Action would have no indirect impacts on local or regional existing or future pedestrian and bicycle route plans.

3.6.4 Proposed Mitigation Measures

No mitigation is required.

3.7 AIR QUALITY

3.7.1 Affected Environment

Air Quality Conformity

Areas that have recorded violations of the National Ambient Air Quality Standards (NAAQS) are classified as non-attainment areas in accordance with the Clean Air Act Amendments (CAAA) of 1990[8] and required by Section 7476 of the CAAA to develop a State Implementation Plan (SIP). The SIP must set allowable emissions levels to be met and also identify control strategies to meet the NAAQS for those pollutants previously identified as non-attainment status.

The Transportation Conformity Rule, found in 40 C.F.R. parts 51 and 93, sets forth the standards and guidelines for determining conformity of a proposed transportation project. Generally, the guidelines require a regional analysis of the Long Range Transportation Plan (LRTP), including the project and all other proposed transportation projects in the region, and a determination by the Metropolitan Planning Organization (MPO) that has jurisdiction over the project area for the project area and the FHWA that the LRTP (with all the projects contained therein) conforms to the control strategies and emissions levels set in the SIP. The Wasatch Front Regional Council (WFRC) is the MPO for the Wasatch Front, including Salt Lake County.

Attainment Status of Project Area

Salt Lake County has been designated as a Moderate Non-attainment Area for particulate matter of less than 10 microns (PM_{10}) and ozone. Further, Salt Lake City, through which the project also extends, has been designated a Maintenance Area for carbon monoxide (CO).

[8] 42 U.S.C. §7401 et seq.

The SIP was approved by the Environmental Protection Agency on August 1, 2005. Therefore, the MPO, with concurrence from FHWA, must determine whether the Proposed Action is in conformity with the SIP.

3.7.2 No-action Alternative

Under the No-action Alternative, traffic congestion in the area would increase due in part to the remaining roadway geometric deficiencies and increasing traffic demand, thereby resulting in a decrease in air quality.

3.7.3 Proposed Action

Direct Effects

Project Level Analysis

The proposed project is currently included in second phase of the Wasatch Front Urban Area 2004-2030 LRTP,[9] which was found to conform to the SIP on August 25, 2006 by the WFRC. FHWA adopted the air quality conformity finding on January 20, 2004. The proposed project, including the addition of one general purpose lane in each direction, is included in an amended financially-constrained 2007- 2012 Transportation Improvement Program (TIP) and included in phase one of the next LRTP (expected in June 2007). See Chapter 4 – Comments and Coordination. The conformity SIP for the new LRTP is currently undergoing the approval process. Once the LRTP and SIP are approved by the EPA, the proposed project would be in conformity with the SIP, as required by 23 CFR 770.

As for ozone, it is a regional pollutant and is not able to be analyzed at the project level. While no further analysis of project-level ozone is necessary, it is important to mention that the Wasatch Front region does have ozone-related issues, especially Salt Lake and Davis Counties. Due to the regional nature of ozone-related issues, it is unlikely that the Proposed Action would have a negative impact on regional ozone levels and, if it reduces traffic congestion and delay, may improve the region's ozone problems, albeit minimally.

Other criteria pollutants include nitrogen dioxide, sulfur dioxide, and lead. There are currently no non-attainment or maintenance areas in Utah for any of these pollutants. Due to their regional nature and the minimization of motor vehicles as a source of these pollutants (especially lead), there is no reason to believe that the Proposed Action will affect concentrations of these pollutants in the project area. Also, no federal laws or regulations have been enacted at this time and the EPA has not established criteria or thresholds for greenhouse gas emissions. Because the sources and effects of greenhouse gases are global in nature, to attempt project-level analysis of negligible increases or decreases of carbon dioxide (the primary greenhouse gas transportation-related emission) is technically unfeasible. Because of high levels of uncertainty, the results of such an analysis would not be likely to inform decision-making at the project level. The scope of such an analysis, with any results being purely speculative, goes far beyond the disclosure impacts needed to make sound transportation decisions.

[9] Future long range transportation planning will be referred to as the Regional Transportation Plan (RTP).

Hot Spot Analyses

This project is in a PM_{10} non-attainment area, but is not of the type listed in 40 CFR 93.123(b)(1). The EPA has determined that projects that are not of the type listed in 40 CFR 93.123(b)(1) meet the Clean Air Act's requirements without any PM_{10} or $PM_{2.5}$ hot-spot analysis.

Since additional travel lanes are included in the scope of this project, hot-spot analysis was done for carbon monoxide levels, per UDOT guidance. The CAL3QHC analysis was performed for the State Street, 700 East, and 1300 East interchanges and for the I-80 mainline itself using one-hour CO concentrations from existing and projected 2030 PM peak hour time periods. The National Ambient Air Quality Standards for carbon monoxide are 35 parts per million (ppm) for the one-hour standard and 9 ppm for the eight-hour standard. As shown in Table 3-3, the Preferred Alternative would not cause CO levels to exceed the National Ambient Air Quality Standards for either the one- or eight-hour standards.

Table 3-3. Projected 2030 Conditions CAL3QHC CO Analysis Results*

Interchange	1-Hour CO Concentration (ppm)	8-Hour CO Concentration (ppm)
I-80 Mainline Freeway	7.80	5.75
I-80 and State Street	9.10	6.66
I-80 and 700 East	9.70	7.08
I-80 and 1300 East	8.60	6.31

*using 2005 actual maximum CO concentration figures obtained from the Utah Department of Environmental Quality, Division of Air Quality for the ambient background concentrations

Under the Proposed Action, there would be no substantial air quality impacts or violations of air quality standards due to the operation of the facility. Construction of the Proposed Action would result in temporary impacts to air quality due to increased airborne dust and particulates from the construction activities.

Indirect Effects

Under the Proposed Action, there would be no indirect impacts to air quality due to the operation of the facility.

3.7.4 Proposed Mitigation Measures

Prior to construction, the proposed project must be included in an approved LRTP that have been found to conform to the SIP. Mitigation during construction will also include the use of dust-control measures per UDOT Standard Specification 01572, Environmental Protection. A permit for air quality impacts during construction will be obtained from the Utah Department of Air Quality (UDAQ) by the contractor to control fugitive dust and emissions.

3.8 NOISE

Traffic noise levels are measured in A-weighted decibels (dBA), which most closely approximate the way the human ear hears sounds at different frequencies. The A-scale emphasizes the higher frequency noise content, since such noise is more annoying and harmful to the human ear. Since traffic noise varies over time, the sound levels for this ES are expressed as "equivalent levels" or L(eq), representing the average sound level.[10] Unless noted otherwise, all sound levels in this ES are expressed in the hourly equivalent noise level. Figure 3-15 illustrates noise levels of common sounds.

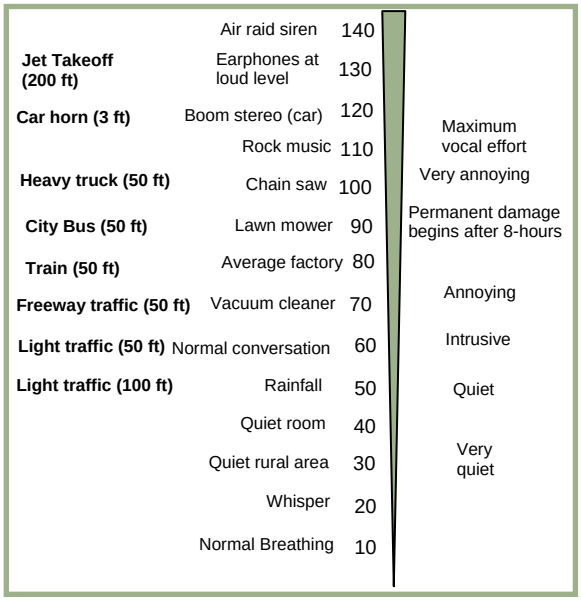

Figure 3-15. Typical Noise Levels (in decibels)

The FHWA has established Noise Abatement Criteria (for absolute noise impacts) for several categories of land use activities. See Table 3-4. The FHWA noise criteria are based on peak-hour L(eq) levels and establish criterion for permissible noise levels for residential, educational, commercial, and industrial locations or "receivers".

Table 3-4. Noise Abatement Criteria (FHWA and UDOT)

NOISE ABATEMENT CRITERIA			
Criterion	**L(eq) [dBA]**		**Land Use Characteristics**
	FHWA	**UDOT**	
A	**57**	**55**	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose
B	**67**	**65**	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, hospitals and cemeteries
C	**72**	**70**	Developed lands, properties, or activities not included in A or B (i.e. commercial, industrial, etc.)
D	**--**		Undeveloped lands.
E	**52**	**50**	Interior of residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums

Primary consideration is to be given for exterior areas for noise abatement purposes, with consideration given for interior areas only where outside human use is minimal, such as hospitals and churches. UDOT's Noise Abatement Criteria utilizes a 2 dBA "approach

[10] See Federal Noise Control Act of 1972, 40 CFR 201-211.

value" (two decibels below FHWA's criteria). UDOT's Noise Abatement Policy[11] states that a traffic noise impact occurs when either 1) the noise level for the design year equals or exceeds the UDOT Noise Abatement Criterion for specified land use categories or 2) the noise level for the design year exceeds the existing noise level by 10 dBA or more.

3.8.1 Affected Environment

The primary source of noise in the project area is automobile and truck traffic from I-80. Existing noise levels were calculated using the Traffic Noise Model (TNM) 2.5 software, which levels were then used to create sound contours. On-site noise measurements were taken to verify the accuracy of the model. Traffic noise levels were taken at the locations identified in Table 3-5 during peak noise level time, which was during the morning commute (7:00 AM to 9:00 AM). Traffic volume is higher during the evening commute; however, traffic speeds are greatly reduced due to poor LOS, resulting in reduced noise levels.

Table 3-5: Receivers Measured for Existing Noise Levels Along I-80 Corridor

Site	Land Use Type	Leq (dBA)	Address/ Location
1	Commercial	66	240 East Robert Avenue
2	Residential	66	376 East Robert Avenue
3	Church	65	LDS Forest Dale Ward Building
4	Residential	65	2360 South 200 East
5	Residential	68	365 East 2400 South
6	Residential	65	604 East Driggs Avenue
7	Motel/Hotel	60	Parrish Bed & Breakfast
8	Park	69	Fairmont Park
9	Residential	63	754 East Parkway Avenue
10	Active sports area	68	Forest Dale Golf Course
11	Residential	65	1140 East Parkway Avenue
12	Residential	68	1246 East Driggs Avenue

Currently, there are noise levels of 65 dBA or higher for 270 residences, one church (LDS Forest Dale Ward Building), two motels/hotels (Ramada Inn and Parrish Place Bed and Breakfast), and five parks (Granite Stake Family Park, South Salt Lake Mini Park, Elizabeth Sherman Park, Forest Dale Golf Course, and Fairmont Park) along the project corridor currently impacted by a noise level of 65 dBA or higher and three businesses (Kentucky Fried Chicken/A&W Rootbeer Restaurant, Red Lobster and Hinckley Dodge) along the project corridor impacted by a noise level of 70 dBA or higher. Sound level contours for the Existing Noise Levels are shown in Figures 3-16 and 3-17.

3.8.2 No-action Alternative

Under the No-action Alternative, there would be noise impacts of 65 dBA or higher for 518 residences and eight churches/motels/parks (LDS Forest Dale Ward Building, Ramada Inn, Parrish Place Bed and Breakfast, Granite Stake Family Park, South Salt Lake Mini Park, Elizabeth Sherman Park, Forest Dale Golf Course, and Fairmont Park) and impacts of 70

[11] UDOT 08A2-1, revised June 16, 2006. UDOT's Noise Abatement Policy is consistent with 23 CFR 772.5.

dBA or higher for four businesses (Kentucky Fried Chicken/A&W Rootbeer Restaurant, Riverton Music, Red Lobster, and Hinckley Dodge). Sound level contours for the No-action Alternative are shown in Figures 3-18 and 3-19.

3.8.3 Proposed Action

Direct Effects

Under the Proposed Action (without any mitigation measures being implemented), there would be noise impacts of 65 dBA or higher for 389 residences and six churches/motels/parks (LDS Forest Dale Ward Building, Ramada Inn, Parrish Place Bed and Breakfast, Granite Stake Family Park, South Salt Lake Mini Park, Elizabeth Sherman Park, and Fairmont Park) and impacts of 70 dBA or higher for four businesses (Kentucky Fried Chicken/A&W Rootbeer Restaurant, Riverton Music, Red Lobster, and Hinckley Dodge). Sound level contours for the year 2030-Proposed Action are shown in Figures 3-20 and 3-21.

Construction Noise Impacts

Temporary construction noise impacts are anticipated due to construction activities and percussive noise sources (i.e., bridge construction and demolition, hauling of materials, engine noise, crack and seat procedures, etc.). There would be construction noise during nighttime hours and weekends in order to reduce the amount of time need to complete construction of the project. Construction noise impacts will be minimized through adherence to UDOT Standard Specification 01355 – Environmental Protection, Section 1.8 - Noise and Vibration Control. Extended disruption of normal activities is not anticipated, since no receptors are expected to be exposed to construction noise for an extended duration.

Indirect Effects

Under the Proposed Action, there would be no indirect impacts on noise levels.

3.8.4 Proposed Mitigation Measures

Under UDOT's Noise Abatement Policy, only Type I projects are eligible for noise abatement measures. Type I projects on Interstate or Limited-Access Highways are projects that involve construction of a highway at a new location or a physical alteration of an existing highway that substantially alters its alignment or increases the number of travel lanes. The proposed project would qualify under Type I due to the new travel lane on I-80.

Noise mitigation will be provided if it is determined to be both feasible[12] and reasonable.[13] Both conditions must be met for the noise abatement measure to be considered. The types of noise mitigation measures considered include:

- Traffic management measures
- Horizontal and/or vertical alignment shifts

[12] Feasible includes considerations as whether it is able to be constructed so as to obtain a minimum of 5 decibels in noise reduction for simple majority of front-row (adjacent) receivers, safe, maintainable, consistent with AASHTO design principles, etc.
[13] Reasonable includes considerations of land uses, cost, etc.

- Construction of berms and associated landscaping
- Noise barrier abatement options
- Alternate noise abatement measures
- Noise insulation of public use or nonprofit institutional structures

Traffic Management Measures

Traffic management measures include reducing speed along I-80 or signing for the restriction of compression brakes. According to the *Highway Traffic Noise Analysis and Abatement Policy and Guidance* report produced by the FHWA, a reduction in speed of more than 20 mph would be necessary for a noticeable decrease in noise levels. I-80 is an Interstate Highway and will have an average approximate speed of 65 miles per hour (mph). A speed limit of 45 mph would be needed to assure a noticeable decrease in noise levels, which is inconsistent with the roadway classification. As for a restriction of compression brakes, Salt Lake County already has an ordinance that prohibits their use within county limits. Therefore, speed reduction and/or the restriction of compression brakes are not viable abatement measures for this project.

Horizontal and/or Vertical Alignment Shifts

The Proposed Action is limited to a narrow corridor through a built urban environment. Acquisition of additional right-of-way in order to alter the horizontal alignment is not reasonable for two reasons. First, the cost associated with the large amount of additional right-of-way would be excessive and second, a change in horizontal road alignment would not provide noise mitigation because of the density of the existing developed communities. From State Street to near 1300 East, I-80 is generally elevated above the surrounding landscape. In order to provide noise mitigation, the roadway would need to be reconstructed below the surrounding grade level. This type of vertical alignment shift for noise mitigation would be excessive for this type and size of roadway.

Construction of Berms and Associated Landscaping

Construction of earth berms can be an effective noise abatement measure. Berms would need to 12 to 14 feet high to be effective, which would require 72 to 84 feet of additional right-of-way in order to accommodate the width for the slope required. Vegetation must be extremely dense and at least 100 feet thick, according to FHWA's June 1995 *Highway Traffic Noise Analysis and Abatement Policy and Guidance,* in order to achieve noticeable noise reduction by itself. The construction of berms and/or landscaping for noise mitigation is not reasonable along I-80 due to the cost associated with the large amount of additional right-of-way that would be required.

Noise Barrier Abatement Options

For a sound wall to be effective, it must be high enough and long enough to block the view of the road from the receiver's perspective. The *Highway Traffic Noise Analysis and Abatement Policy and Guidance* states that a good rule of thumb is that the noise barrier should extend four times as far in each direction as the distance from the receiver to the barrier. For instance, if the receiver is 50 feet from the proposed noise barrier, the barrier needs to extend at least 200 feet on either side of the receiver in order to shield the receiver from noise traveling past the ends of the barrier.

In order to be reasonable, the cost of a noise barrier cannot exceed $25,000 per impacted and benefited receiver (i.e., any impacted receiver that gets a noise reduction of 5 dBA or more from the noise wall). Noise walls costs were estimated at $20.00 per square foot for the cost of the noise barrier and its related installation. Where noise barrier was analyzed for on-structure placement over the bridges, the cost of $40.00 per square foot was used due to the expense associated with reinforcing the structure to support the additional weight of the barrier. For non-residential areas (including parks), UDOT's Noise Abatement Policy states that "mitigation for noise abatement will not exceed $200 per linear foot of wall (for a 10-foot high wall) installed." This equates to $20.00 per square foot, which was used as the cost for noise barrier placed adjacent to the public parks.

Due to the size of the project study area, the I-80 corridor was divided into smaller sections for analysis. These sections are as follows:

- **North of I-80 (State Street to 700 East)**
- **South of I-80 (State Street to 700 East)**
- **North of I-80 (700 East to 1300 East)**
- **South of I-80 (700 East to 1300 East)**

Several different scenarios of noise barrier heights and lengths were evaluated, including putting noise barrier over the bridge structures and in the gore areas[14] between the on/off ramps and the I-80 mainline. The proposed locations for noise barriers are illustrated in Figures 3-22 and 3-23. All of the recommended barriers meet the cost requirement.

North of I-80 (State Street to 700 East)

For this section, a 12-ft high noise barrier is recommended along the entire section (4,681 ft. in length), with no noise barriers in the gore areas. This barrier would benefit 126 (or approximately 65%) of the 193 impacted receivers in this area (192 residences, 0 churches/motels/parks, and 1 business) and would maintain visibility from I-80 to the businesses near State Street (Kentucky Fried Chicken/A&W Rootbeer Restaurant, Ramada Inn, South Salt Lake City Offices).

[14] The gore areas are the triangular parcels of land between the I-80 mainline and the on/off ramps.

South of I-80 (State Street to 700 East)

For this section, a 12-ft high noise barrier is recommended beginning at the Avalon Valley Rehabilitation Center and running east to 700 East (3,291 ft, in length), with no noise barriers in the gore areas. This barrier would benefit 64 (or approximately 79%) of the 81 impacted receivers in this area (77 residences, 2 churches/motels/parks, and 2 businesses) and would maintain visibility from I-80 for the businesses near State Street (Kentucky Fried Chicken/A&W Rootbeer Restaurant, Ramada Inn, South Salt Lake City Offices).

North of I-80 (700 East to 1300 East)

For this section, a 14-ft high noise barrier is recommended beginning at 700 East and running east to the Fairmont Park parking lot (1,900 ft), with no noise barriers in the gore areas. This barrier would benefit 22 (or approximately 50%) of the 44 impacted receivers in this area (40 residences, 3 churches/motels/parks, and 1 business) and would maintain the view to and from businesses, commercial areas, and Fairmont Park adjacent to I-80.

South of I-80 (700 East to 1300 East)

700 East to 900 East

For this section, a 14-ft high noise barrier is recommended from 700 East to 900 East (2,040.5 ft. in length), with a gore wall at 700 East interchange along the eastbound on-ramp. This barrier would benefit 29 of the 56 impacted receivers in this area (55 residences, 1 church/motel/park, and 0 businesses).

900 East to 1300 East

For this section, a 14-ft high noise barrier is recommended from Highland Drive to 1300 East (763 ft. in length), with no barriers in the gore areas.[15] This barrier would benefit 9 of the 25 impacted receivers in this area (25 residences, 0 church/motel/park, and 0 businesses).

[15] Gore walls at this location would be ineffective due to the change in elevation that occurs around 1300 East where I-80 dips below the surrounding area.

Balloting

The UDOT Noise Policy states that noise abatement measures will only be provided if a combination of 75% of the total number of impacted[16] front row (adjacent) receivers and 67% of the total number of overall impacted and benefited[17] receivers (which number includes front row receivers) vote[18] in favor of the noise barrier.[19] Further, if the impacted property owners vote to reject the construction of a noise barrier, their area will not be reconsidered for future noise abatement unless a future transportation project falls under the guidelines for a Type I project.

The final decision as to whether to build the recommended noise barriers will be made during the design phase of the project. One ballot per resident/land owner of record will be sent via regular mail with a deadline for the ballots to be received by UDOT. If all ballots sent to the "front-row" (adjacent) receivers are not returned by the deadline, a second ballot will be sent to these residents/landowners since they will receive the greatest impact of the mitigation. Only in unusual circumstances will registered mail and/or door-to-door solicitation be considered for balloting. Ballots not returned by the deadline will be counted as "non-responsive and indifferent."

Alternate Noise Abatement Measures

The UDOT Noise Abatement Policy states that alternative noise abatement measures may be proposed and approved by the Transportation Commission when it can be demonstrated that a severe traffic noise impact will occur. A severe traffic noise impact is defined as a traffic noise impact that increases residential noise levels by 30 dBA or more over existing levels or the resulting noise levels are greater than or equal to 80 dBA. It is not anticipated that either of these conditions will occur by the design year, so alternative noise abatement measures will not be considered.

Noise Insulation of Public Use or Nonprofit Institutional Structures

The UDOT Noise Abatement Policy states that noise insulation of public use or nonprofit institutional structures may be considered as a noise abatement measure when determined reasonable and feasible. No facilities in the project area qualified for this consideration.

[16] Impacted for front row receivers is defined both as noise impacts and as potential visual impacts that may result from the construction of a noise wall adjacent to the receiver.
[17] Benefited is defined as receiving a minimum 5 decibel reduction in noise levels.
[18] Only the owner of record of the residence/property determined to be an impacted receiver will be allowed to cast a ballot. If front-row receivers consist of a mix of residential and commercial properties, the ballots of front-row receivers will be weighted based on the percentage of their property frontage to the total frontage along the transportation corridor being considered for a noise barrier.
[19] UDOT will consider written documentation from local governments and/or community councils of their noise wall/abatement desires and/or local building ordinances as one of the factors (but not the sole factor) prior to making a decision on noise abatement within their area of jurisdiction.

3.9 GEOLOGY, SOILS, AND TOPOGRAPHY

3.9.1 Affected Environment

The project area is located in the Salt Lake Valley in the Wasatch Front Valleys section of the Great Basin physiographic region. This area is characterized by block-fault mountain ranges trending north-south, separated by alluvium filled valleys and closed desert basins. Elevation ranges from 4,250 ft above sea level on the western end of the project area to 4,450 ft above sea level on the eastern end. Much of I-80 is located on a steep grade sloping from the edge of pavement down toward to the right-of-way fence line. Soil composition in the area includes concentrations of expansive clay, which can swell when wet and generate forces sufficient to crack walls and foundations of relatively light residential structures.

3.9.2 No-action Alternative

Under the No-action Alternative, there would be no alterations to the overall geological features and soil composition in the project area. Current conditions regarding soil settlement, if any, would continue to exist.

3.9.3 Proposed Action

The Proposed Action would not alter the overall geological features and soil composition in the project area. However, there may be some settlement of the soils from the increased weight of the roadway due to the addition of the retaining walls along the project area, the increased weight of the bridge structures and new on/off ramps, and infill of the area under the existing Highland Drive Bridge structure. The degree of the potential settlement is unknown at this time, but will be fully evaluated during the design phase. Figure 3-24 shows the areas where settlement is currently predicted as likely to occur.

3.9.4 Mitigation

UDOT will evaluate and compensate for damages to structures related to soil settlement issues, if any, on an individual basis during the design and construction phases.

3.10 WATER QUALITY

3.10.1 Affected Environment

Applicable Federal and State Regulations

The Federal Water Pollution Control Act[20] (also known as the Clean Water Act (CWA)), controls discharge of dredge or fill material into "waters of the United States" and requires states and Indian tribes to set specific water quality criteria and pollution control programs. The Environmental Protection Agency (EPA) is charged with regulating its implementation and has delegated certain portions of its authority to the Utah Department of Environmental Quality (UDEQ). The applicable sections of the CWA are Section 401 (State Water Quality Certification), Section 402 (National Pollution Discharge Elimination System (NPDES)), and Section 404 (Permit for Placing Fill in Waters of the U.S.). Utah also has a program to regulate pollutant discharge known as the Utah Pollutant Discharge Elimination System (UPDES).

Groundwater

The Salt Lake Valley, in which the project area is located, is part of the Jordan River watershed. Groundwater occurs in unconsolidated deposits under water-table and artesian conditions with recharge occurring along the bases of the surrounding mountain ranges (the Oquirrh Mountains to the west and the Wasatch Mountains to the east). The Jordan River drains both surface and groundwater into the Great Salt Lake.

Rivers, Streams and Dry Washes

Parley's Creek runs from the mouth of Parley's Canyon through Sugarhouse Park and Hidden Hollow Park in the easternmost section of the project area. The Salt Lake City wastewater system currently drains into Parley's Creek.

3.10.2 No-action Alternative

Under the No-action Alternative, current trends in water quality would continue. Stormwater, containing debris, dirt, and chemicals (including fuel, motor oil, etc.), would continue to sheet flow off the roadway surface and either enter the existing drainage system or, where storm drains were clogged or otherwise incapable of receiving the stormwater runoff, seep untreated into the ground.

3.10.3 Proposed Action

Direct Effects

Under the Proposed Action, there would be an increase in stormwater runoff due to the increase in impervious surfaces. The Proposed Action would increase the amount of stormwater runoff from Highland Drive west to the end of the project area from approximately 22 cubic feet per second (cfs) to 38 cfs. From Highland Drive east, there is not expected to be an appreciable difference in the amount of stormwater runoff.

[20] 33 U.S.C. 1251-1376.

The Proposed Action would include improvements to the drainage system in the project area to correct the existing deficiencies in the drainage system and to accommodate the anticipated increase in stormwater from the increase in impervious surface. Existing drains would be cleaned, repaired, and/or relocated, if relocation is necessary due to changes in the bridge structures and pavement profile. Stormwater runoff originating from approximately Highland Drive west would be directed to an existing underground conduit that drains into several interconnected detention ponds located near I-15, west of the project area. Stormwater runoff originating from Highland Drive east would be directed into the existing Salt Lake City drainage system that currently empties into Parley's Creek by way of a new detention basin planned for placement within the loop of the 1300 East westbound on-ramp at Sugarhouse Park. Both drainage systems would have sufficient capacity to handle the anticipated increase in stormwater runoff. The use of the existing detention basins near I-15 and the proposed detention basin at Sugarhouse Park would help maintain or improve water quality in the area by providing means whereby stormwater runoff could be stripped of dirt, debris, and chemicals prior to entering the watershed.

Construction of the Proposed Action would require relocation or reconstruction of some features of the existing storm drain system. During construction, there is the potential for temporary soil erosion and sediment/siltation impacts.

Indirect Effects
There would be no indirect impacts on water quality from the Proposed Action.

3.10.4 Proposed Mitigation Measures

A Storm Water Pollution Prevention Plan (SWPPP) will be developed and incorporated into the final design plans of the project and a Notice of Intent (NOI) will be submitted to the Utah Division of Water Quality (UDWQ) prior to construction of the project. Short-term impacts to water quality will be minimized through implementation of UDOT's Best Management Practices (BMP), found in the Temporary Erosion and Sediment Control Manual (July 1999). Mitigation measures also include the addition of the new stormwater detention basin near 1300 East.

3.11 CULTURAL RESOURCES

3.11.1 Affected Environment

Utah Historic Preservation Act (Utah Code Annotated §9-8-102 et seq.)
The Utah Historic Preservation Act was passed to provide protection of "all antiquities, historic and prehistoric ruins, and historic sites, buildings, and objects which, when neglected, desecrated, destroyed or diminished in aesthetic value, result in an irreplaceable loss to the people of this state."[21] Section 404 of the Utah Historic Preservation Act requires state agencies to consider the effect of any undertaking on any historic sites included in or eligible for inclusion on the National Register of Historic Places or on the State Register prior to approval of the undertaking or the expenditure of

[21] U.C.A §9-8-401.

any state funds and also allow a reasonable opportunity for comments from the State Historic Preservation Office (SHPO). Section 302 defines an historic property as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (NRHP)". Eligibility is determined under the criteria set forth in Table 3-6. The term includes artifacts, records, and remains related to and located within such properties and includes properties of religious and cultural importance to Native American tribes.

Table 3-6. National Register of Historic Places Criteria

NRHP Criterion	Characteristics
A	Associated with events that have made a significant contribution to the broad patterns of our history.
B	Associated with the lives of persons significant in our past.
C	Embody distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic value, or that represent a significant and distinguishable entity whose components may lack individual distinction.
D	Yielded, or may be likely to yield, information important in prehistory or history.

The boundaries of historic properties are drawn so as to include the elements of each property that contribute to its setting, feeling, and/or association, such as outbuildings, landscape and natural features, undeveloped farmland associated with agricultural properties, etc.[22] In urban and suburban area, the boundary may be limited to the legally recorded parcel number or lot lines when those parcels retain their historic boundaries and integrity.[23] Potentially historic properties are evaluated for eligibility for listing on the NRHP, based upon certain criteria regarding the structures' history and architecture. See Table 3-7.

Table 3-7. SHPO Rating Criteria

SHPO Rating	Characteristics
A	**Eligible/Significant:** Built within the historic period and retains integrity; excellent example of a style or type; unaltered or only minor alterations or additions; individually eligible for NRHP under Criterion C; also, structures of known historical significance.
B	**Eligible:** Built within a historic period and retains integrity; good example of a style or type, but not as well-preserved or well-executed as "A" structures; more substantial alterations or additions than "A" structures, though overall integrity is retained; eligible for NRHP as part of a potential historic district or primarily for historical rather than architectural reasons (which cannot be determined at this point).
C	**Ineligible:** Built during the historic period but has had major alterations or additions; no longer retains integrity.
D	**Ineligible:** Out-of-period; built during the modern era.

[22] National Register Bulletin 21, pg. 3.
[23] National Register Bulletin 16A, pg.56.

Historic Properties

To identify the historic properties within or in close proximity to the project area, a Reconnaissance Level Survey (RLS) was conducted, which consisted of those properties immediately adjacent to the I-80 corridor where any impacts would be most likely to occur. The RLS identified the existence of the Highland Park Historic District, which is listed on the NRHP as a locally significant district. The boundaries roughly extend from Parkway Avenue on the north, 1500 East on the east, 2700 South on the south, and Elizabeth Street on the west, all of which is outside of the project area (with the exception of 4 individual properties). The historic properties in the project area are identified in Figure 3-25 and Table 3-8.

Table 3-8: Impacts on Historic Structures from Proposed Action

Address	Photo	Date	Style	SHPO Rating	Finding of Effect	Impact
2408 South 1300 East		1949	Early Ranch (Gen.)	A *[NHRP listed*]*	Adverse Effect	Direct ROW impact to house; total acquisition
2412 South 1300 East		1949	Early Ranch (Gen.)	A *[NHRP listed*]*	Adverse Effect	Direct ROW impact to house; total acquisition
2393 South 500 East		c.1890	Victorian Eclectic	B	No Effect	None
2435 South 500 East		c.1895	Victorian Eclectic	B	No Adverse Effect	ROW acquisition of ≈77 sq. ft.; no impact to structures
2434 South 600 East		c.1925	English Cottage/ English Tudor	B	No Adverse Effect	ROW acquisition of ≈903 sq. ft.; no impact to structures
2437 South 600 East		c.1905	Victorian: Other	C	Ineligible	None
2319 South 700 East		c.1920	Bungalow	B	No Adverse Effect	ROW acquisition of ≈48 sq. ft.; no impact to structures

Address	Photo	Date	Style	SHPO Rating	Finding of Effect	Impact
2323 South 700 East		c.1915	Bungalow	B	No Adverse Effect	ROW acquisition of ≈101 sq. ft.; no impact to structures
2327 South 700 East		c.1928	Colonial Revival Bungalow	B	No Adverse Effect	ROW acquisition of ≈148 sq. ft.; no impact to structures
2331 South 700 East		c.1925	English Cottage	B	No Adverse Effect	ROW acquisition of ≈305 sq. ft.; no impact to structures
2349 South 700 East		1939	Minimal Traditional	B	No Adverse Effect	ROW acquisition of ≈393 sq. ft.; no impact to structures
2357 South 700 East		1938	Early Ranch (Gen.)	A	No Adverse Effect	ROW acquisition of ≈478 sq. ft.; no impact to structures
2435 South 700 East		1921	Bungalow	B	No Adverse Effect	ROW acquisition of ≈460 sq. ft.; no impact to structures
2437 South 700 East		1910	Victorian Eclectic Late 20th: Other	C	Ineligible	ROW acquisition of ≈163 sq. ft.; no impact to structures
2447 South 700 East		c.1910	Bungalow	B	No Adverse Effect	ROW acquisition of ≈106 sq. ft.; no impact to structures
2394 South 800 East		c.1915	Bungalow	C	Ineligible	Total acquisition due to ROW proximity impact
2401 South 800 East		c.1920	Bungalow	C	Ineligible	None

Address	Photo	Date	Style	SHPO Rating	Finding of Effect	Impact
?2402 South 800 East		c.1905	Bungalow	B	No Effect	None
2334 South 900 East		c.1905	Victorian Eclectic	A	No Effect	None
?2361 South 900 East *(Fairmont Park)*		c.1935	Other/ Undefined	B	No Effect	None
2375 South 900 East *(Forest Dale Golf Course)*		1906	Mission	A	No Effect	None
2386 South 900 East		c.1960	Ranch/ Rambler (Gen.)	C	Ineligible	None
2392 South 900 East		c.1940	Minimal Traditional Colonial Revival	B	No Effect	None
2398 South 900 East		c.1915	Bungalow	B	No Effect	None
720 East Ashton Ave. *(Parrish Place B&B)*		c.1890	Victorian Eclectic	A *[NRHP & SLCRCR** Listed]]*	No Effect	None
748 East Ashton Ave.		c.1925	Colonial Revival Bungalow	B	No Effect	None
752 East Ashton Ave.		c.1925	Bungalow	B	No Effect	None

Address	Photo	Date	Style	SHPO Rating	Finding of Effect	Impact
766 East Ashton Ave.		c.1915	Bungalow	A	No Adverse Effect	ROW acquisition of ≈515 sq. ft.; no impact to structures
770 East Ashton Ave.		c.1900	Neoclassical	B	No Adverse Effect	ROW acquisition of ≈1,307 sq. ft.; no impact to structures
504 East Driggs Ave.		c.1945	Minimal Traditional	B	No Effect	None
518 East Driggs Ave.		c.1945	Minimal Traditional	B	No Effect	None
524 East Driggs Ave.		c.1945	Minimal Traditional	B	No Effect	None
532 East Driggs Ave.		c.1945	Minimal Traditional	B	No Effect	None
536 East Driggs Ave.		c.1905	Victorian: Other	A	No Effect	None
538 East Driggs Ave.		c.1935	English Cottage	A	No Adverse Effect	Potential settlement impact on lot; no impact anticipated on structures
550 East Driggs Ave.		c.1890	Victorian Eclectic Contemporary	B	No Adverse Effect	Potential settlement impact on lot; no impact anticipated on structures
552 East Driggs Ave.		c.1945	Minimal Traditional	B	No Adverse Effect	ROW acquisition of ≈78 sq. ft.; no impact to structures

Address	Photo	Date	Style	SHPO Rating	Finding of Effect	Impact
560 East Driggs Ave.		c.1945	Minimal Traditional	C	Ineligible	None
562 East Driggs Ave.		c.1895	Victorian Eclectic	B	No Adverse Effect	ROW acquisition of ≈303 sq. ft.; no impact to structures
572 East Driggs Ave.		c.1915	Bungalow	B	No Adverse Effect	ROW acquisition of ≈41 sq. ft.; no impact to structures
574 East Driggs Ave.		c. 1925	Colonial Revival Bungalow	A	No Adverse Effect	Potential settlement impact on lot; no impact anticipated on structures
584 East Driggs Ave.		1873	Classical: Other	A	No Effect	None
604 East Driggs Ave.		c.1895	Victorian Eclectic English Cottage	B	No Adverse Effect	Potential settlement impact on lot; no impact anticipated on structures
1200 East Driggs Ave.		c.1930	Minimal Traditional	B	No Effect	None
1208 East Driggs Ave.		1929	Bungalow	C	Ineligible	None
1216 East Driggs Ave.		c.1930	Bungalow	A	No Effect	None
1220 East Driggs Ave.		c.1940	Minimal Traditional	B	No Effect	None

Address	Photo	Date	Style	SHPO Rating	Finding of Effect	Impact
1224 East Driggs Ave.		1948	Minimal Traditional	B	No Effect	None
1232 East Driggs Ave.		1948	Minimal Traditional	B	No Effect	None
1238 East Driggs Ave.		1948	Contemporary	C	Ineligible	None
1246 East Driggs Ave.		1948	Early Ranch (Gen.)	A	No Effect	None
1252 East Driggs Ave.		1948	Minimal Traditional	B	No Effect	None
1258 East Driggs Ave.		1948	Minimal Traditional	C	Ineligible	None
1266 East Driggs Ave.		1952	Early Ranch (Gen.)	B	No Effect	None
1270 East Driggs Ave.		1948	Early Ranch (Gen.)	A	No Adverse Effect	ROW acquisition of ≈77 sq. ft.; no impact to structures
1278 East Driggs Ave.		1949	Early Ranch (Gen.)	A	Adverse Effect	Direct ROW impact to house; total acquisition
2409 South Highland Dr.		1954	Contemporary	C	Ineligible	None

Address	Photo	Date	Style	SHPO Rating	Finding of Effect	Impact
2420 South Highland Dr. *(Utah Light & Railway SE Substation)*		c.1911	Neoclassical Spanish Colonial Revival	A *[NHRP listed*]*	No Effect	None
2360 South Lake Street		c.1930	Period Revival: Other	B	Adverse Effect	Total acquisition due to ROW proximity impact
2416 South Lake Street		c.1915	Bungalow	A	No Effect	None
2420 South Lake Street		c.1915	Bungalow	A	No Effect	None
2422 South Lake Street		c.1940	20th Century: Other	B	No Effect	None
759 East Parkway Ave.		c.1905	Bungalow Victorian: Other	B	Adverse Effect	Total acquisition due to ROW proximity impact
825 East Parkway Ave.		c. 1915	Bungalow Prairie School	A	No Adverse Effect	Potential settlement impact on lot and outbuilding; no impact anticipated on primary structure
831 East Parkway Ave.		c.1925	Bungalow Colonial Revival	A	No Adverse Effect	Potential settlement impact on lot and outbuilding; no impact anticipated on primary structure
837East Parkway Ave.		c.1925	Bungalow Colonial Revival	B	No Adverse Effect	Potential settlement impact on lot and outbuilding; no impact anticipated on primary structure
843 East Parkway Ave.		c.1919	Arts & Crafts Bungalow	A	No Adverse Effect	Potential settlement impact on lot and outbuilding; no impact anticipated on primary structure

Address	Photo	Date	Style	SHPO Rating	Finding of Effect	Impact
849 East Parkway Ave.		c.1935	English Cottage	C	Ineligible	Potential settlement impact
857 East Parkway Ave.		c.1900	Victorian: Other	B	No Adverse Effect	Potential settlement impact
861 East Parkway Ave.		c.1935	English Cottage	C	Ineligible	Potential settlement impact
865 East Parkway Ave.		c.1910	Bungalow	B	No Effect	None
1315 East Parkway Ave.		c.1940	Minimal Traditional Colonial Revival	B *[NHRP listed*]*	No Effect	None
567 East Warnock Ave.		c.1920	20th Century: Other	C	Ineligible	ROW acquisition of ≈339 sq. ft.; no impact to structures

**Included in the Highland Park Historic District on the NRHP*
***Salt Lake City Register of Cultural Resources*

Archaeological Resources

A cultural resources survey of the project area was conducted, which evaluated the potential for archaeological resources (other than historic structures) in the project area. The survey indicated that there was one documented cultural resource in the project area, as well as one Isolated Occurrence (IO). See Figure 3-25. The site is the abandoned Brick Plant Branch of the Denver and Rio Grand Railroad and is located under I-80 along the western side of Highland Drive. The rails and all railroad-related features have been removed and no evidence of the railroad segment remains. It is therefore not eligible for inclusion in the NRHP. The IO (identified as a concrete box with a metal lid of unknown origin or purpose) is not eligible for inclusion in the NRHP.

Native American Coordination

Area tribes were contacted by UDOT to inform them about the proposed highway improvement project and to solicit their participation at whatever level they deemed appropriate. Letters dated April 3, 2007 were sent to the Northwestern Band of Shoshone, the Skull Valley Band of Goshute Indians, the Goshute Indian Band, the

Uintah & Ouray Ute Indian Reservation, and the Shoshone-Bannock Tribes. See Chapter 4 – Comments and Coordination. This letter also informed the tribes that historians and archeologists would begin studying the area and that their participation in preserving the cultural resources in the project area would be welcomed. No verbal or written responses to the letters were received.

3.11.2 No-action Alternative

Under the No-action Alternative, there would be no impacts to cultural resources.

3.11.3 Proposed Action

Direct Effects

Under the Proposed Action, there would be an Adverse Effect on five historic properties eligible for inclusion on the NRHP and there would be a No Adverse Effect on 23 eligible historic properties, seven of which are related to potential settlement. There would be no adverse effects on any eligible archeological resources.

A Determination of Eligibility and Finding of Effect (DOEFOE) was prepared by UDOT, as the lead agency, outlining the determinations of eligibility for inclusion on the NRHP and the type of effect from the implementation of the Proposed Action shown in Table 3-7, which was submitted to the State Historic Preservation Office (SHPO) for concurrence. A copy of the executed DOEFOE can be found in Chapter 4 – Comments and Coordination.

Indirect Effects

Under the Proposed Action, there would be no indirect impacts to cultural resources.

3.11.4 Proposed Mitigation Measures

UDOT will continue to work towards resolution of the adverse effects of the Proposed Action. A Memorandum of Agreement (MOA) will be executed that stipulates how the adverse effects will be resolved. UDOT will extend an invitation to Salt Lake City Corporation to participate in the MOA as a consulting party. Mitigation measures may include, but are not limited to, preparing an Intensive Level Survey (ILS) for the five homes for which an adverse effect was found; investigating the possibility of adding properties within the survey area for listing on the NRHP; or using project funds to aid in a historic preservation project in Salt Lake City.

During construction, if previously unidentified cultural resources are encountered, the Contractor shall comply with UDOT Standard Specification Section 01355, Part 1.10, Discovery of Historical, Archaeological or Paleontological Objects.

3.12 VISUAL CONDITIONS

3.12.1 Affected Environment

Visual conditions in the area consist of older residential neighborhoods with scattered commercial areas near State Street, 700 East, and 1300 East. The I-80 roadway is elevated above the adjacent property so as to dominate the north/south view shed from the adjacent neighborhoods. The slopes of the roadway are covered in vegetation and separated from the neighborhoods by chain link fencing. Between 900 East and Highland Drive, I-80 is sandwiched between Fairmont Park on the north and the Forest Dale Golf Course on the south.

3.12.2 No-action Alternative

Under the No-action Alternative, the visual conditions in the area would change consistent with continuing residential and/or commercial redevelopment (including planned commercial redevelopment in Sugar House near Highland Drive and 2100 South). There would be no visible changes to I-80.

3.12.3 Proposed Action

Direct Effects

Under the Proposed Action, there would be new bridge structures for both the mainline and for the ramps at State Street, 700 East, and 1300 East. The width of the roadway would be increased, with pavement replacing the open median between directional travel lanes and retaining walls that would take the place of the existing slopes, including the loss of some vegetation along the slopes. The retaining walls would not obstruct more of the view shed from the surrounding communities than currently exist, as they would not exceed the height of the roadway as at present. Depending upon the outcome of the noise wall balloting, there would be new noise walls in various locations that would obstruct the north/south views, mostly from the roadway itself since the noise walls would be adjacent to the roadway (either just outside the 42” barriers or on the retaining walls themselves) and residents adjacent to I-80 already have the existing slopes in their view shed. There would also be a loss of trees and other vegetation on the slopes of the roadway, to be replaced with retaining walls.

There would also be temporary visual impacts due to the use of construction signs, barricades, exposed earth, and construction equipment in the project area during construction, as well as from the construction of the bridge structures at the staging sites, and the potential loss of vegetation from construction activities.

Indirect Effects

There would be no indirect visual impacts from the Proposed Action.

3.12.4 Proposed Mitigation Measures

Design-related Context Sensitive Solutions (CSS) will be considered, including aesthetic treatments to retaining walls along I-80 and in connection with the bridges, aesthetic treatments to noise walls (if approved), and landscaping compatible with the surrounding area (where appropriate). Visual impacts due to construction activities would be temporary in nature and would require no mitigation.

3.13 INVASIVE SPECIES

3.13.1 Affected Environment

Executive Order 13112 directs federal agencies to expand and coordinate their efforts to combat the introduction and spread of plants and animals not native to the United States and to the individual regions. The Order defines invasive species as "any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health." Also, the Utah Noxious Weed Act, U.C.A §4-17-1 et seq., requires each county to formulate and implement a countywide noxious weed control program designed to prevent and control noxious weeds within its county.

3.13.2 No-action Alternative

Under the No-action Alternative, existing conditions would continue unaffected.

3.13.3 Proposed Action

Direct Effects

Under the Proposed Action, the potential exists for invasive species to be introduced and/or propagated in the project area due to construction activities that disturb the existing ground cover.

Indirect Effects

There would be no indirect impacts on invasive species from the Proposed Action.

3.13.4 Proposed Mitigation Measures

To minimize the potential introduction and spread of invasive species, the contractor will be required to comply with UDOT's Special Provision 02926S – Invasive Weed Control, which includes:

- Cleaning all earth-moving equipment entering the project area
- Treating existing noxious weeds ten days before starting earthwork operations
- Controlling invasive weeds using pre-emergent, selective, and non-selective herbicides, as appropriate

UDOT will specify on all construction contract documents that seed mix used for landscaping and/or erosion control must be free of noxious weeds and other invasive plant species. In areas of particular sensitivity, extra precautions will be taken if invasive species are found in or adjacent to the construction areas, including inspection and cleaning of construction equipment and eradication strategies to be implemented should an invasion occur.

3.14 CONSTRUCTION

3.14.1 Affected Environment

Construction activities would be limited to those areas within and immediately adjacent to I-80 and the intersections of the cross streets for the bridge replacements. Staging areas would be located in the loop of the 1300 East westbound on-ramp and at other various locations adjacent to I-80.

3.14.2 No-action Alternative

Under the No-action Alternative, there would be no construction activities and therefore, no construction-related impacts.

3.14.3 Proposed Action

Direct Effects

Detours/ Road Closures

Construction of the bridge structures is anticipated to occur in staging areas near I-80, using periodic weekend road closures and rapid bridge replacement techniques to minimize construction impacts. It is anticipated that 300 East, 500 East, 600 East, 700 East, 900 East, and Highland Drive will be closed to through traffic underneath the I-80 roadway for construction activities at various times throughout the construction timeframe, as needed. Possible construction staging areas include:

- The South Salt Lake Mini Park (300 East)
- The parking lot of the LDS Nibley Ward building and the western access road for the Riverton Music building (600 East)
- Inside the gore areas of the 700 East Interchange
- The parking lot of the Forest Dale Golf Course; the parking lot of the Fairmont Park, and/or the area immediately adjacent to I-80 on the southwest corner of 900 East and Ashton Avenue
- Inside the loop of the westbound on-ramp at 1300 East

Social/ Economic/ Pedestrian and Bicycles

Area residents, commuters, and others who currently utilize I-80 would experience temporary inconveniences due to noise, dust, traffic, and travel delays during construction. Access to all properties and businesses would be maintained.

Air Quality

Construction of the Proposed Action would result in temporary impacts to air quality due to increased airborne dust and particulates from the construction activities.

Noise

Temporary construction noise impacts are anticipated due to construction activities and percussive noise sources (i.e., bridge construction and demolition, hauling of materials, engine noise, crack and seat procedures, etc.). There would be construction noise during nighttime hours and weekends in order to reduce the amount of time need to complete construction of the project. Extended disruption of normal activities is not anticipated, since no one receptor is expected to be exposed to construction noise of a long duration.

Water Quality

Construction would require relocation or reconstruction or some features of the existing storm drain system, including the construction of a new detention basin within the loop of the 1300 East westbound on-ramp. Also, there is the potential for temporary soil erosion and sediment/siltation impacts during construction.

Visual

There would be temporary visual impacts due to the use of construction signs, barricades, exposed earth, and construction equipment in the project area during construction, as well as from the construction of the bridge structures at the staging areas.

Invasive Species

The potential exists for invasive species to be introduced and/or propagated in the project area due to construction activities that disturb the existing ground cover.

Indirect Effects

There would be no indirect impacts as a result of construction for the Proposed Action.

3.14.4 Proposed Mitigation Measures

Detours/ Road Closures

- **Traffic Control** – The Contractor will be required to prepare a detailed traffic control plan that will maintain access to all commercial and residential properties throughout project implementation. The Contractor will be required to submit an approved traffic control plan prior to the commencement of construction related activities (see UDOT Standard Specification 01554 – Traffic Control.)
- **Public Involvement** - The Contractor will be required to provide an approved public involvement plan to notify the traveling public and adjacent property owners of construction related issues and concerns. The Contractor will coordinate construction activities with adjacent property owners (see UDOT Standard Specification 01315 – Public Information)

Social/ Economic

Construction impacts will be mitigated by use of a traffic control plan, as well as noise, vibration-control, and dust-control measures. Access to all residences and businesses will be maintained.

Air Quality

Mitigation during construction will include the use of dust-control measures per UDOT Standard Specification 01572 - Environmental Protection. A permit for air quality impacts during construction will be obtained from the Utah Department of Air Quality (UDAQ) by the contractor to control fugitive dust and emissions.

Noise

Construction impacts due to noise and vibration will be minimized through adherence to UDOT Standard Specification 01355, Section 1.8 - Noise and Vibration Control. Further, the Contractor will obtain construction noise permits from the cities prior to beginning construction.

Hazardous Waste

If hazardous waste material is encountered during construction, mitigation will be coordinated in accordance with UDOT Standard Specification 01355, which directs the Contractor to stop work and notify the Project Engineer of any such discovery. Disposition of hazardous material would then take place under guidelines set by the Utah Department of Environmental Quality.

Visual

Visual impacts due to construction would be temporary and require no mitigation.

Invasive Species

To minimize the potential introduction and spread of invasive species, the contractor will be required to comply with UDOT's Special Provision 02926S - Invasive Weed Control, which includes:

- Cleaning all earth-moving equipment entering the project area
- Treating existing noxious weeds ten days before starting earthwork operations
- Controlling invasive weeds using pre-emergent, selective, and non-selective herbicides, as appropriate

UDOT will specify on all construction contract documents that seed mixed used for landscaping and/or erosion control must be free of noxious weeds and other invasive plant species. In areas of particular sensitivity, extra precautions will be taken if invasive species are found in or adjacent to the construction areas, including inspection and cleaning of construction equipment and eradication strategies to be implemented should an invasion occur.

3.15 CUMULATIVE IMPACTS

Cumulative impacts are defined as the incremental impacts of actions on an environmental resource when added to other past, present and reasonably foreseeable future actions.[24] The geographic area and time frames addressed in this cumulative impacts analysis vary with the environmental resource under discussion.

3.15.1 Past, Present, and Reasonably Foreseeable Future Actions That May Affect the Environment

Land Use

The project area consists of land that is fully developed with long-established residential neighborhoods, parks and open spaces, and commercial areas. Future projects for the area revolve around providing more mass transit and pedestrian-friendly modes of travel, such as the Sugar House Light Rail and the Parley's Creek Canyon Trail. It is not likely that any major changes to land use will occur in the project area in the near future.

Social

Social conditions in the project area are relatively stable with regards to community cohesion. The Proposed Action, especially due to the proposed noise mitigation measures, would decrease the existing noise levels in many sections of the project area below the level already existing. Emphasis has already been placed on making the Sugar House area a "walkable" community with new commercial establishments being built adjacent to the sidewalks and parking lots behind the storefronts. Future projects in the area involve improving public facilities and mass transit options that would improve the quality of life in the area and make it a more desirable place to live.

Water Quality

Water quality in the area has been recognized by the local and state governments as a matter of paramount importance and several initiatives have been implemented to both protect the watershed (the Salt Lake City Watershed Master Plan) and to conserve water usage (the Salt Lake City 2004 Water Conservation Master Plan), including extensive public awareness campaigns. These efforts, along with other governmental regulation and planning activities concerning water quality protection and management, help to maintain, if not improve, the quality of the water resources in the project area.

Cultural Resources

The project area includes several historic resources that are included on the National Register, including the Highland Park Historic District on the southeastern-most portion of the project area and other historic properties along I-80, as discussed in Section 3.12 – Cultural Resources. The historic structures in the area predate the initial construction of I-80 and most have been kept up in good condition. This area has maintained its integrity and is likely to continue to do so for the near future due to the lack of developable land in

[24] 40 CFR 1508.7

the project area, although there are currently developmental pressures in the Sugar House commercial area just north of the project area.

Visual

The view shed for the project area has not had any major alteration since the construction of I-80. The Proposed Action would change the view shed by the addition of new bridge structures, increased pavement surfaces, and potentially noise walls. Anticipated future alterations in the view shed, not including those anticipated from the Proposed Action; include the commercial redevelopment of Sugar House, the proposed Parley Creek Trail, and the inclusion of the Sugar House light rail project.

3.15.2 Irreversible and Irretrievable Commitments of Resources

No-action Alternative

There would be no commitment of natural, physical, human, or fiscal resources for the project area under the No-action Alternative, with the exception of those resources required for routine maintenance of the roadway and emergency bridge repairs.

Proposed Action

The Proposed Action would require the investment of certain natural, physical, and human resources that are not retrievable, including the fiscal resources necessary for construction. Considerable amounts of fossil fuels, labor, and roadway construction materials such as cement, aggregate, and bituminous material would be expended, as well as the labor and natural resources involved in the fabrication and preparation of said materials. It would also require the conversion of additional land to roadway use, albeit mostly land already within the existing right-of-way. Land used in the construction of the facility is considered an irreversible commitment during the time period that the land is used for a roadway facility. However, if a greater need arises for the use of the land or if the roadway facility is no longer needed, the land could be converted to another use. As I-80 is presently an important part of the national transportation system, such a conversion will not be likely to occur in the near future.

3.15.3 Short-Term Uses of Man's Environment Versus Long Term Productivity

Short-term refers to the immediate consequences of the project; long-term relates to its direct or secondary effects on future generations.

No-action Alternative

The short-term consequences would be continued deterioration of the structural integrity of the pavement and bridges, continued traffic flow and congestion problems, and continued safety concerns. Long term productivity would eventually require the replacement of the bridge structures, if not further improvements to the pavement, interchanges, ramps, etc.

Proposed Action

The Proposed Action would have the following short-term consequences:

- Relocation of seven residents
- Reconfiguration of travel patterns due to closing Driggs Avenue and construction detours
- Inconvenience to residents, business owners, commuters, and motorists on I-80 and the surrounding local streets due to construction activities

The Proposed Action would realize the following long-term benefits:

- Increased safety on the I-80 mainline and interchanges
- Improved traffic flow and capacity, resulting in greater energy efficiency
- New bridge structures and pavement resurfacing
- Reduction in traffic noise for the surrounding communities
- Improvements to the drainage systems for stormwater runoff

3.16 SUMMARY OF MITIGATION/OTHER COMMITMENTS

SUMMARY OF COMMITMENTS	
Land Use 	**Parks -** Mitigation measures include Context Sensitive Solutions (CSS), such as aesthetic treatments, landscaping, etc.
Social 	Construction impacts will be mitigated by use of a traffic control plan, as well as noise, vibration-control, and dust-control measures. Access to all residences and businesses will be maintained. Construction-related closures will be minimized through the use of rapid bridge replacement techniques and only periodic weekend road closures.
Economic 	Construction impacts will be mitigated by use of a traffic control plan, as well as noise, vibration-control, and dust-control measures. Access to all residences and businesses will be maintained.
Relocations 	Any right of way acquisitions will occur in accordance with federal, state, and local relocation policies. The acquisition and relocation program will be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. Relocation resources will be available to each relocated residence without discrimination. UDOT will evaluate the need to provide early right of way acquisition for those property owners who demonstrate a hardship due to this project.

Air Quality 	Prior to construction, the proposed project must be included in an approved LRTP that have been found to conform to the SIP. Mitigation during construction will also include the use of dust-control measures per UDOT Standard Specification 01572 - Environmental Protection. A permit for air quality impacts during construction will be obtained from the Utah Department of Air Quality (UDAQ) by the contractor to control fugitive dust and emissions.
Noise 	Construction noise will be minimized through adherence to UDOT Standard Specification 01355, Section 1.8 - Noise and Vibration Control. The final decision as to whether to build the recommended noise barriers will be made during the design phase of the project.
Geology 	UDOT will evaluate and compensate for damages related to soil settlement, if any, on an individual basis during the design phase.
Water Quality 	A Storm Water Pollution Prevention Plan (SWPPP) will be developed and incorporated into the final design plans of the project and a Notice of Intent (NOI) will be submitted to the Utah Division of Water Quality (UDWQ) prior to construction of the project. Short-term impacts to water quality will be minimized through implementation of UDOT's Best Management Practices (BMP), found in the Temporary Erosion and Sediment Control Manual (July 1999). Mitigation measures also include the addition of the new stormwater detention basin near 1300 East.
Cultural Resources 	UDOT will continue to work towards resolution of the adverse effects of the Proposed Action. A Memorandum of Agreement (MOA) will be executed that stipulates how the adverse effects will be resolved. UDOT will extend an invitation to Salt Lake City Corporation to participate in the MOA as a consulting party. Mitigation measures may include, but are not limited to, preparing an Intensive Level Survey (ILS) for the five homes for which an adverse effect was found; investigating the possibility of adding properties within the survey area for listing on the NRHP; or using project funds to aid in a historic preservation project in Salt Lake City. If, during construction, previously unidentified cultural resources are encountered, the Contractor shall comply with UDOT Standard Specification Section 01355, Part 1.10 - Discovery of Historical, Archaeological, or Paleontological Objects.
Hazardous Waste 	If hazardous waste material is encountered during construction, mitigation will be coordinated in accordance with UDOT Standard Specification 01355, which directs the contractor to stop work and notify the Project Engineer of any discovery of hazardous material. Disposition of the hazardous material would then take place under guidelines set by the UDEQ.

Visual 	Design-related Context Sensitive Solutions (CSS) will be considered, including aesthetic treatments to retaining walls along I-80 and in connection with the bridges, aesthetic treatments to noise walls (if approved), and landscaping compatible with the surrounding area (where appropriate). Visual impacts due to construction activities would be temporary in nature and would require no mitigation.
Invasive Species 	To minimize the potential introduction and spread of invasive species, the contractor will be required to comply with UDOT's Special Provision 02926S – Invasive Weed Control, which includes: • Cleaning all earth-moving equipment entering the project area • Treating existing noxious weeds ten days before starting earthwork operations • Controlling invasive weeds using pre-emergent, selective, and non-selective herbicides as appropriate UDOT will specify on all construction contract documents that seed mix used for landscaping and/or erosion control must be free of noxious weeds and other invasive plant species. In areas of particular sensitivity, extra precautions will be taken if invasive species are found in or adjacent to the construction areas, including inspection and cleaning of construction equipment and eradication strategies to be implemented should an invasion occur.
Construction 	<u>Detours/ Road Closures</u> Traffic Control – The Contractor will be required to prepare a detailed traffic control plan that will maintain access to all commercial and residential properties throughout project implementation. The Contractor will be required to submit an approved traffic control plan prior to the commencement of construction related activities (see UDOT Standard Specification 01554 – Traffic Control.) Public Involvement - The Contractor will be required to provide an approved public involvement plan to notify the traveling public and adjacent property owners of construction related issues and concerns. The Contractor will coordinate construction activities with adjacent property owners (see UDOT Standard Specification 01315 – Public Information) <u>Social/ Economic</u> Construction impacts will be mitigated by use of a traffic control plan, as well as noise, vibration-control, and dust-control measures. Access to all residences and businesses will be maintained. <u>Air Quality</u> Mitigation during construction will include the use of dust-control measures per UDOT Standard Specification 01572 - Environmental Protection. A permit for air quality impacts during construction will be obtained from the Utah Department of Air Quality (UDAQ) by the contractor to control fugitive dust and emissions.

	Noise Construction impacts due to noise and vibration will be minimized through adherence to UDOT Standard Specification 01355, Section 1.8 - Noise and Vibration Control. Further, the Contractor will obtain construction noise permits from the cities prior to beginning construction. Hazardous Waste If hazardous waste material is encountered during construction, mitigation will be coordinated in accordance with UDOT Standard Specification 01355, which directs the Contractor to stop work and notify the Project Engineer of any such discovery. Disposition of hazardous material would then take place under guidelines set by the Utah Department of Environmental Quality. Visual Visual impacts due to construction would be temporary and require no mitigation. Invasive Species To minimize the potential introduction and spread of invasive species, the contractor will be required to comply with UDOT's Special Provision 02926S - Invasive Weed Control, which includes: • Cleaning all earth-moving equipment entering the project area • Treating existing noxious weeds ten days before starting earthwork operations • Controlling invasive weeds using pre-emergent, selective, and non-selective herbicides, as appropriate UDOT will specify on all construction contract documents that seed mixed used for landscaping and/or erosion control must be free of noxious weeds and other invasive plant species. In areas of particular sensitivity, extra precautions will be taken if invasive species are found in or adjacent to the construction areas, including inspection and cleaning of construction equipment and eradication strategies to be implemented should an invasion occur.